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117. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

A frustum of a paraboloid of revolution closed at both ends has a given volume. Find its interior dimensions when its surface is a minimum.

118. Proposed by J. W. YOUNG, Oliver Graduate Student, Cornell University, Ithaca, N. Y.

Find the differential equations of the system of parabolas, $y^2 = 4a^2(x + a^2)$, and of its orthogonal trajectories, and interpret the result. Find also the equation of the system of trajectories.

*** Solutions of these problems should be sent to J. M. Colaw not later than Jan. 10.

MECHANICS.

105. Proposed by WALTER H. DRANE, Graduate Student, Harvard University, Cambridge, Mass.

A man, weighing 150 pounds at the surface of the earth, ascends in a balloon, until the area visible to him is $2\pi R^2(1 - \frac{1}{2}\sqrt{2})$. What is his weight at that height?

106. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy, Irving College, Mechanicsburg, Pa.

Vary the radius of curvature of a plane curve inversely as the abscissa; then the solution will give you, (1) Ryan's Equation of the Elastic Curve, and (2) Wood's Equation of the Hydrostatic Curve.

*** Solutions of these problems should be sent to B. F. Finkel not later than Jan. 10.

AVERAGE AND PROBABILITY.

97. Proposed by L. C. WALKER, A. M., Professor of Mathematics, Leland Stanford Jr. University, Palo Alto, Cal.

A straight line is drawn at random across a circle, and five points are taken at random in the surface of the circle. Required the chance that all the points are on the same side of the line.

98. Proposed by REV. PREBENDARY WHITWORTH, A. M.

A has £ m and B has £ n . They play for points until one of them has lost all his money. If α and β be the respective chances that A and B win any point, the expectation of the number of points played will be

$$\frac{n\alpha^n(\alpha^m - \beta^m) - m\beta^m(\alpha^n + \beta^n)}{(\alpha - \beta)(\alpha^{m+n} - \beta^{m+n})}.$$

*** Solutions of these problems should be sent to B. F. Finkel not later than Jan. 10.

MISCELLANEOUS.

98. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

A particle describes an ellipse under an attraction always directed to the vertex; to determine the law of the attraction.

99. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy, Irving College, Mechanicsburg, Pa.

Through the zenith of an observer at the sea-coast in north latitude $\varphi=40^\circ$, a "cat's-tail cloud," height $h=10$ miles, extends northeast until it touches the horizon. How far from the observer is the *advance-end* of the cloud? What is the length of the cloud measured from the end specified to the observer's zenith?

*** Solutions of the problems should be sent to J. M. Colaw not later than Jan. 10.

EDITORIALS.

Prof. B. O. Peirce, of Harvard University, has been granted a year's leave of absence.

Dr. G. A. Bliss has been appointed Instructor in Mathematics at the University of Minnesota.

Prof. Irvin Stringham has returned to the University of California after a year of travel in Europe.

Prof. W. Dyck has been appointed Director of the Technical High School in Munich for the next three years.

Prof. R. E. Allardice, of Leland Stanford Jr. University, is spending a year abroad on leave of absence.

Prof. E. J. Townsend has returned to the University of Illinois, after two years of study at the University of Göttingen.

Owing to our engravers having sent the plate of Mr. Tucker's portrait to some other Springfield, and which has not yet been returned to us, we are obliged to have it appear in next issue.

BOOKS AND PERIODICALS.

Logarithmic and Trigonometric Tables, Five-Place and Four-Place. Edited by D. A. Murry, Cornell University. 8vo. Cloth, 96 pages. Price, 54 cents. New York: Longmans, Green & Co.

This book contains Five-Place Logarithms of Numbers; Five-Place Logarithms of the sine, cosine, tangent and cotangent for each minute from 0° to 90° ; also Four-Place Logarithms corresponding to the Five-Place Logarithms of Number and the Trigonometric Functions. The editor believes that the proportional parts should be calculated, and not copied, by those who use logarithms and trigonometric tables for the first time. So these tables do not have the proportional parts set down in the tables. We heartily concur with him in this opinion.

B. F. F.